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LEAF NECTARIES OF GOSSYPIUM

E. L. REED

(WITH PLATES XII AND XIII AND ONE FIGURE)

On the midrib and sometimes on the other principal veins on the underside of leaves of *Gossypium*, certain nectar glands are found. All species of cotton, with the possible exception of *G. tomentosum*,

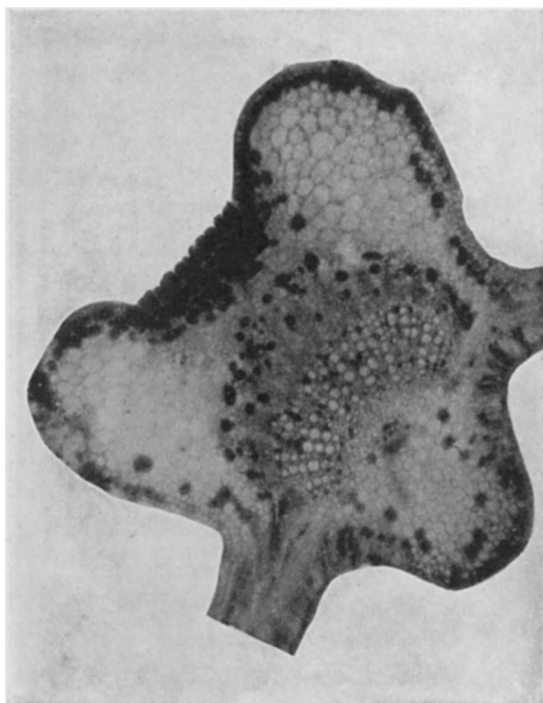


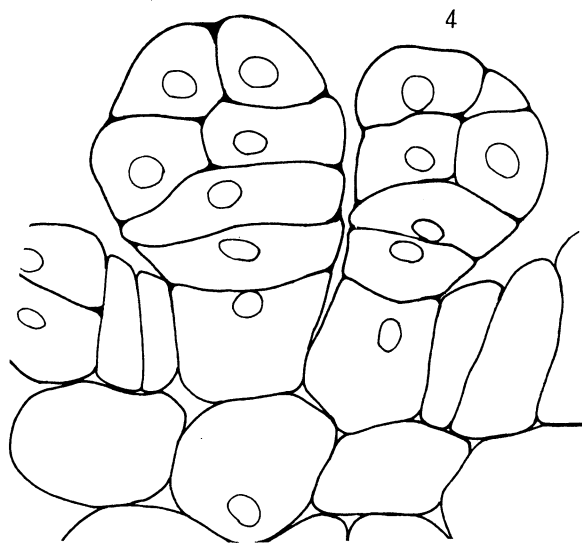
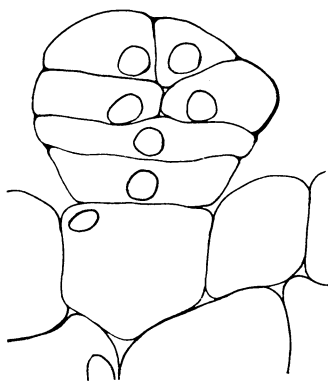
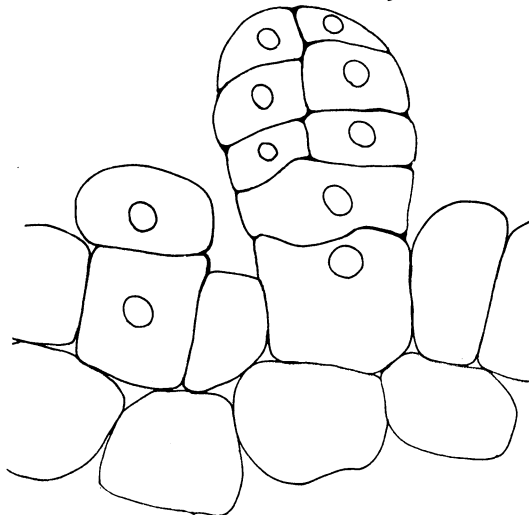
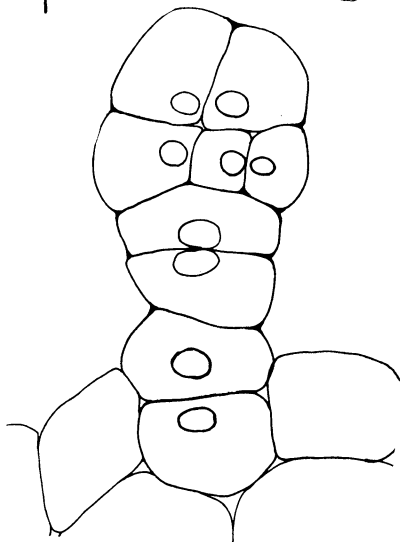
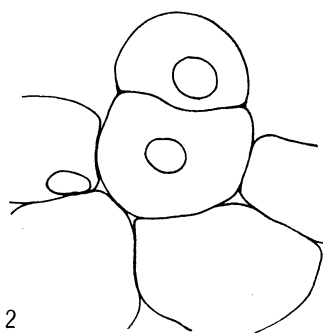
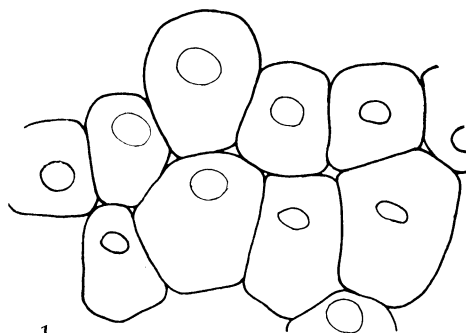
FIG. 1.—Nectar gland on a leaf of *Gossypium hirsutum*

possess these glands, which are usually oval or pear-shaped, sometimes even sagittate in form. TAYLOR (1) says "these glands are usually small, rounded, shallow pits, with a floor of round-topped secreting cells"; and WATT (2) states that "these midrib glands may be elongated and elevated portions of the veins that

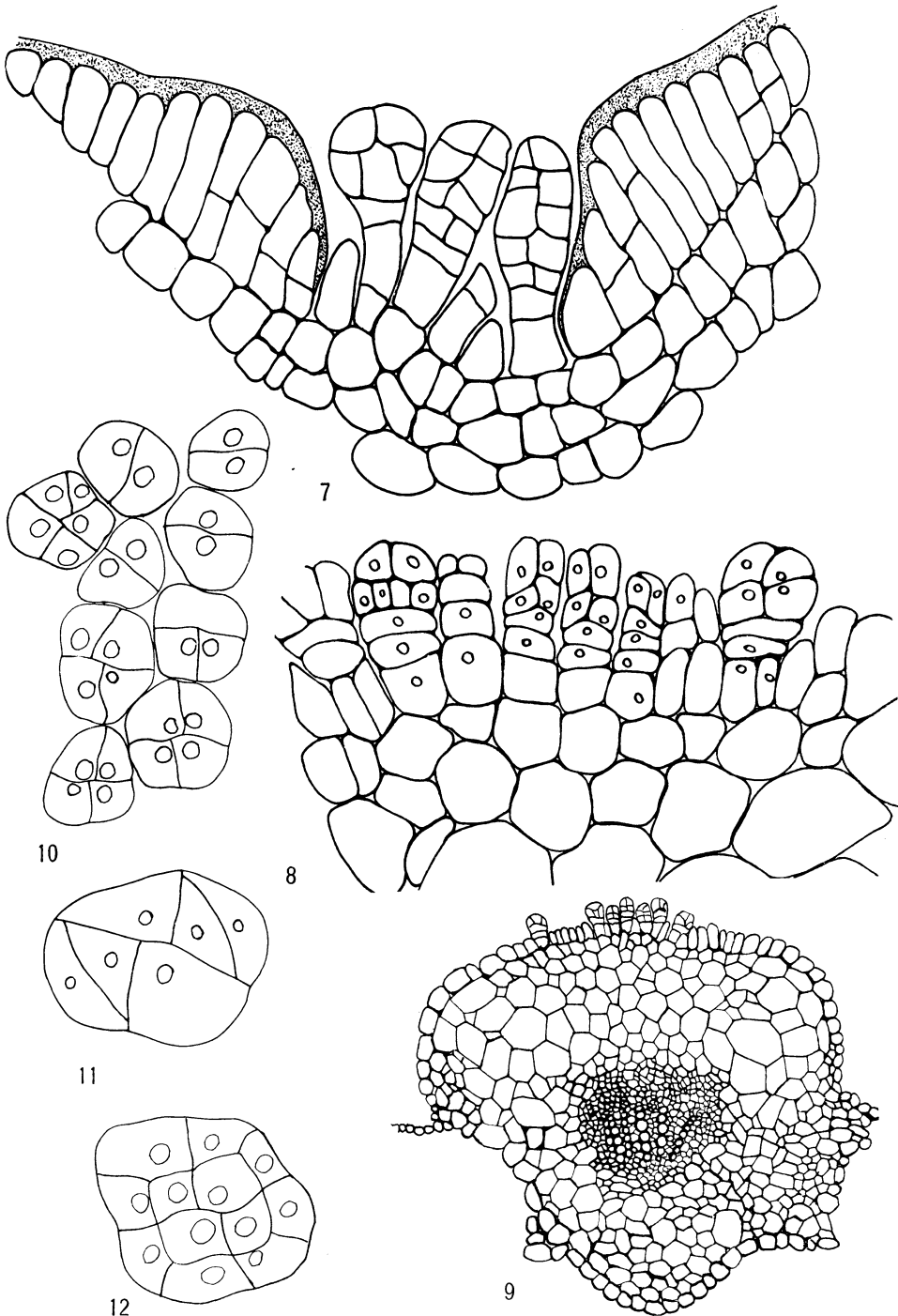
become pale colored or assume a pink tinge, and then rupture lengthwise, or they may be circular or oblong warts which open into distinct pits." TRELEASE (3) points out that the glands begin to secrete at about the time the seedling has expanded 4 leaves, and that the nectar is secreted most abundantly at night. SAFORD (4) states that "they . . . occur on all leaves of cotton . . . in the form of vaginated glands." He gives a photograph by HOWARD, of the United States Department of Agriculture, of a cross-section of a nectar gland of the cotton leaf.

The glands described in this paper are from *Gossypium hirsutum*. They are oval-shaped depressions, filled with closely crowded multicellular papillae and surrounded by a thick wall of epidermal cells (text fig. 1 and fig. 7). In all cases observed the glands became visible on the cotyledons about the time the first pair of true leaves developed; they began to secrete a little later. Sections were made of the cotyledons as soon as they were fully expanded; of the second and third pair of true leaves at different stages of development; and also of mature leaves. A section through a gland of a mature leaf is shown in fig. 7 and one through that of a young leaf in fig. 9. These glands are of epidermal origin and consist of numerous multicellular papillae (text fig. 1). Their organogeny is as follows:

The epidermal cells from which the glands arise cease to develop normally and become papillate (fig. 1). The papillae are next cut off by transverse walls (fig. 2). The cells thus formed divide again in the same plane; this may be repeated once or twice, and results in the formation of short pedestals consisting of 2, 3, or 4 cells (figs. 3-6). The terminal cell of each papilla then divides by a vertical wall into two (fig. 10). These in turn divide by walls at right angles to the first cross wall into 4 cells (fig. 10). The latter divide by periclinal walls into 4 central and 4 peripheral cells (fig. 11). Lastly, each of the external cells divides by a wall at right angles to the surface, and thus a peripheral layer of 8 cells is formed (fig. 12). The development of the papillae of these glands bears a remarkable resemblance to that of the antheridia of *Riccia* (5).



REED on LEAF NECTARIES



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LITERATURE CITED

1. TAYLOR, FREDERICK J., The nectaries of cotton. Bull. no. 131, Part V, Bur. Plant Ind., U.S. Dept. Agric.
2. WATT, GEORGE, Wild and cultivated cotton plants of the world.
3. TRELEASE, WILLIAM, Nectar, its nature, occurrence, and uses. Published in JOHN HENRY COMSTOCK'S Report on cotton insects.
4. SAFFORD, W. EDWIN, Useful plants of Guiam.
5. CAMPBELL, D. H., Mosses and ferns.

EXPLANATION OF PLATES XII AND XIII

PLATE XII

FIG. 1.—From transverse section of leaf showing papillate cell.

FIG. 2.—First cell of pedestal cut off by cross wall.

FIGS. 3, 4, 5, 6.—Multicellular papillae showing pedestals with varying number of cells.

PLATE XIII

FIG. 7.—Vertical section through gland near one end showing papillae and elongated cells; some of the latter have divided horizontally, and have formed the wall of the gland.

FIG. 8.—Vertical section through young gland showing first stage in formation of wall (right side of figure).

FIG. 9.—Vertical section through midrib showing young papillae.

FIG. 10.—Cross-section of several papillae showing first and second vertical division.

FIG. 11.—Cross-section of papilla showing periclinal walls.

FIG. 12.—Cross-section of mature papilla showing divisions subsequent to those shown in fig. 11.